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PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A.
4800 IDS CENTER
80 SOUTH 8TH STREET
MINNEAPOLIS, MN 55402-2100

EXAMINER

DOTE, JANIS L

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| ART UNIT | PAPER NUMBER |
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1756

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/699,039

Applicant(s)

GRAZULEVICIUS ET AL.

Examiner

Janis L. Dote

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 1-22 is/are allowed.
6) ☒ Claim(s) 23-25 is/are rejected.
7) ☒ Claim(s) 26 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

Art Unit: 1756

1. The examiner acknowledges the amendments to claims 3, 10, 17, 23, and 25, filed on Nov. 29, 2004. Claims 1-26 are pending.

2. The objection to the abstract set forth in the office action mailed on Nov. 1, 2004, paragraph 5, has been withdrawn in response to the amended abstract filed on Nov. 29, 2004.

The objections to the specification set forth in the office action mailed on Nov. 1, 2004, paragraph 6, have been withdrawn in response to the amended paragraphs beginning at page 10, line 16, page 11, line 3, page 12, line 16, and page 25, line 11, of the specification, filed on Nov. 29, 2004.

The objections to the specification set forth in the office action mailed on Nov. 1, 2004, paragraph 7, have been withdrawn in response to the amended paragraph beginning at page 3, line 28, of the specification, filed on Nov. 29, 2004.

The objections to claims 3, 10, 17, and 25 set forth in the office action mailed on Nov. 1, 2004, paragraph 8, have been withdrawn in response to the amendments to claims 3, 10, 17, and 25, filed on Nov. 29, 2004.

The rejection of claim 23 under 35 U.S.C. 102(b) over US 6,416,915 B1 (Kikuchi), set forth in the office action mailed on Nov. 1, 2004, paragraph 13, has been withdrawn in response to

Art Unit: 1756

the amendment to claim 23, adding the limitation that the "charge transport material comprises only one functional group having a vinyl group"; and in response to applicants' comments that the polymerization group $-O-CH_2-CH=CH_2$ in the Kikuchi compound 242 is known as an "allyl ether" not a vinyl ether group, which is defined as $-O-CH=CH_2$ in the response filed on Nov. 29, 2004, page 15, lines 9-15. The terms allyl and vinyl refer to the chemical structures $-CH_2-CH=CH_2$ and $-CH=CH_2$, respectively. See the IUPAC Appendix of Trivial and Abbreviated Names for Compounds with Radical Centers on Carbon Atoms, List A. Names retained in "Guide to IUPAC Nomenclature of Organic Compounds," Recommendations 1993, which has been listed on the attached form PTO-892. (Applicants' comments with respect to the other cited documents in the response filed on Nov. 29, 2004, page 15, line 16, to page 16, line 7, were not probative because applicants did not provide copies of the portions of the documents relied on to support their position.)

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 1756

4. Claims 23-25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Instant claims 23-25 recite that the charge transport material having the formula recited in instant claim 23 comprises "only one functional group having a vinyl group."

The originally filed specification does not provide an adequate written description of said charge transport material. The originally filed specification discloses a charge transport material of the generic formula disclosed at page 2, line 24 to page 3, line 7, page 8, lines 14-27, and page 19, line 21, to page 20, line 6. The originally filed specification discloses that the group V comprises a vinyl ether group. The originally filed specification at page 9, lines 3-9, discloses that the term "'group' indicates that the generically recited chemical entity (e.g., alkyl group, phenyl group, vinyl ether group, carbazole group, julolidine group, or (N,N-disubstituted)arylamine group, etc.) may have any substituent

Art Unit: 1756

thereon which is consistent with the bond structure of that group. For example, when the term 'alkyl group' is used, that term would not only include unsubstituted linear [sic], branched and cyclic alkyls, such as methyl, ethyl . . . but also substituents such as hydroxyethyl, cyanobutyl, 1,2,3-trichloropropyl and the like." Thus, the other groups in the formula, e.g., R_1 , R_2 , X, and Z, can be substituted by any functional group. The originally filed specification does not exclude a charge transport material comprising more than one functional group having a vinyl group. Nor does the originally filed specification disclose that the use a charge transport material comprising more than one functional group having a vinyl group in an organophotoreceptor is detrimental to the organophotoreceptor. Moreover, there is no evidence on the present record to show that the inclusion of more than one functional group having a vinyl group in the charge transport material is detrimental to the charge transport material. The only disclosure of charge transport compounds represented by the formula recited in instant claim 23 that comprise "only one functional group having a vinyl group" is at page 20 of the specification, which shows two particular compounds. The formula recited in claims 23-25 is broader than the two particular disclosed compounds, where X is $-\text{CH}_2\text{CH}_2-$, V is

Art Unit: 1756

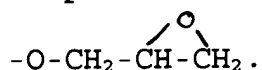
-O-CH=CH₂, R₁ is phenyl, R₂ is H, and Z is a particular carbazole or a p-N,N-diphenylaminophenylene, because the formula includes compounds that are not the two disclosed particular compounds, such as when R₁ is either H or an alkyl group, or R₂ is either an alkaryl or an aryl group. The two particular disclosed species do not provide an adequate written description of the formula broadly recited in instant claims 23-25. Applicants have not indicated where in the originally filed specification there is written support for the limitation "the charge transport material comprises only one functional group having a vinyl group" recited in instant claims 23-25. Applicants can only exclude what they possessed. See In re Johnson, 194 USPQ 187 (CCPA 1977). In this instance, the claimed limitation "comprises only one functional group having a vinyl group" was not recognized in the specification as filed. Its use now introduces new concepts, and therefore violates the descriptive requirement of the first paragraph of 35 U.S.C. 112. See Ex parte Grasselli, 231 USPQ 393 (Bd. App. 1983).

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Art Unit: 1756

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,416,915 B1 (Kikuchi).

Kikuchi discloses the hole (i.e., charge) transport hydrazone compound 241 at cols. 81-82. The compound 241 comprises two chain-polymerization functional groups



The Kikuchi compound 241 is not representative of the charge transport compound represented by the formula recited in instant claim 23, which requires that the group V comprise a vinyl ether group.

However, Kikuchi teaches that the chain-polymerization functional groups can equally be the chain polymerization functional group $\text{-CH}_2\text{-O-CH=CH}_2$. Col. 5, line 63, and compounds 55 and 56 at cols. 27-28. Kikuchi also discloses that the chain-polymerization functional groups can be identical or different. Col. 3, lines 13-16 and 19-22; and compound 17 at cols. 15-16. Kikuchi discloses that said hole transporting compound comprising at least two chain polymerization functional groups, i.e. compounds 17, 55, 56, and 241, forms a polymerizate. According to Kikuchi, when a surface layer in an electrophotographic photoreceptor comprises said polymerizate, the photoreceptor has high film strength leading to improved

Art Unit: 1756

anti-abrasion and anti-scar characteristics. Col. 2, lines 52-56, and col. 3, lines 5--23.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Kikuchi, to substitute the chain-polymerization group $-O-CH_2-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-CH_2-$ that is p-substituted on the phenyl group that is attached directly to the nitrogen atom in the hydrazone moiety, "N-N=CH-" (emphasis added) in the Kikuchi compound 241 with the equivalent chain polymerization functional group $-CH_2-O-CH=CH_2$, because that person would have had a reasonable expectation of successfully obtaining a hole transporting compound comprising at least two chain polymerization functional groups that is capable of forming a polymerizate which when used in the surface of an electrophotographic photoreceptor improves the anti-abrasion and anti-scar characteristics of the photoreceptor.

The resulting hole transporting compound comprising at least two chain polymerization functional groups that is rendered obvious over the teachings in Kikuchi meets the compositional limitations of the formula recited in instant claim 23. Said compound is represented by the formula recited in instant claim 23, when Z is the p-N,N-disubstituted-aminophenyl group shown in the Kikuchi compound 241, where one of the phenyl groups is p-substituted with the group

Art Unit: 1756

$\text{-CH}_2\text{CH}_2\text{-OCH}_2\text{-CH}(\text{O})\text{-CH}_2$, R_2 is H, R_1 is phenyl, X is the p-methylene-substituted phenylene group, $\text{-C}_6\text{H}_4\text{-CH}_2\text{-}$, and V is -OCH=CH_2 . The p-methylene-substituted phenylene group meets the definition of X recited in instant claim 23, where X is of the formula $\text{-(CH}_2\text{)}_2\text{-}$ where "one of the methylene groups is optionally replaced by . . . an aromatic group." Because said compound comprises the chain polymerization groups, i.e., $\text{-OCH}_2\text{-CH}(\text{O})\text{-CH}_2$ and $\text{-CH}_2\text{-O-CH=CH}_2$, the compound comprises "only one functional group having a vinyl group" as recited in instant claim 23.

7. Claim 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikuchi.

Kikuchi discloses the hole (i.e., charge) transport hydrazone compound 241 at cols. 81-82. The compound 241 comprises two chain-polymerization functional groups $\text{-O-CH}_2\text{-CH}(\text{O})\text{-CH}_2$.

Kikuchi does not exemplify a hole transport compound as represented by the formula recited in instant claim 25 where the group V is -O-CH=CH_2 , and the group X is $\text{-CH}_2\text{CH}_2\text{-}$. The Kikuchi compound 241 comprises the hole transport group represented by formula (5) disclosed at col. 4, lines 1-11, where n^1 is 0, the group Ar^4 is phenyl, and the group R^{14} is phenyl that is p-substituted with the group $\text{-O-CH}_2\text{-CH}(\text{O})\text{-CH}_2$. However, Kikuchi

Art Unit: 1756

discloses that the phenyl group that is p-substituted with the chain-polymerization group $-O-CH_2-\overset{\text{O}}{\underset{\text{O}}{\text{CH}}}-CH_2$ may equally be a similarly substituted alkyl group. Col. 4, lines 7-10, which discloses that the group R^{14} in formula (5) can denote an "alkyl group, aralkyl group, or aryl group, each capable of having a substituent, or a hydrogen atom." Kikuchi exemplifies compounds where the group R^{14} is methyl. See compounds 220 and 221 at cols. 75-76. Kikuchi also teaches that the chain-polymerization functional groups can equally be the chain polymerization functional group $-CH_2-O-CH=CH_2$. Col. 5, line 63, and compounds 55 and 56 at cols. 27-28. Kikuchi discloses that the chain-polymerization functional groups can be identical or different. Col. 3, lines 13-16 and 19-22; and compound 17 at cols. 15-16. Kikuchi discloses that said hole transporting compound comprising at least two chain polymerization functional groups, i.e., compounds 17, 55, 56, and 241, forms a polymerizate. According to Kikuchi, when a surface layer in an electrophotographic photoreceptor comprises said polymerizate, the photoreceptor has high film strength leading to improved anti-abrasion and anti-scar characteristics. Col. 2, lines 52-56, and col. 3, lines 5-23.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Kikuchi, to

Art Unit: 1756

substitute the phenyl group that is p-substituted with the chain polymerization functional group $-O-CH_2-\overset{\text{O}}{\text{CH}}-CH_2$ in the hole transporting compound 241 with a methyl group that is substituted with the equivalent chain-polymerization functional $-CH_2-O-CH=CH_2$, such that resulting hole transporting compound comprises the group $-CH_2CH_2-O-CH=CH_2$ attached directly to the nitrogen atom in the hydrazone moiety, " $-\underline{N}-N=CH-$ " (emphasis added), because that person would have had a reasonable expectation of successfully obtaining a hole transporting compound comprising at least two chain polymerization functional groups that is capable of forming a polymerizate which when used in the surface of an electrophotographic photoreceptor improves the anti-abrasion and anti-scar characteristics of the photoreceptor.

The resulting hole transporting compound comprising at least two chain polymerization functional groups that is rendered obvious over the teachings in Kikuchi meets the compositional limitations of the formula recited in instant claim 25. Said compound is represented by the formula recited in instant claim 25, when Z is the p-N,N-disubstituted-aminophenyl group shown in the Kikuchi compound 241, where one of the phenyl groups is p-substituted with the group $-CH_2CH_2-OCH_2-\overset{\text{O}}{\text{CH}}-CH_2$, R_2 is H, R_1 is phenyl, X is the ethylene, and

Art Unit: 1756

V is $-\text{OCH}=\text{CH}_2$. Because said compound comprises the chain polymerization groups, i.e., $-\text{OCH}_2-\overset{\text{O}}{\text{CH}}-\text{CH}_2$ and $-\text{CH}_2-\text{O}-\text{CH}=\text{CH}_2$, the compound comprises "only one functional group having a vinyl group" as recited in instant claim 25.

8. Applicant's arguments filed on Nov. 29, 2004, with respect to the rejections over Kikuchi set forth in paragraphs 6 and 7 above have been fully considered but they are not persuasive.

Applicants assert that Kikuchi does not teach or suggest a compound as recited in instant claim 23, because instant claim 23 requires that the compound have only one functional group having a vinyl group.

However, as discussed in the rejections, Kikuchi teaches that the two chain-polymerization functional groups can be different groups. In the compounds rendered obvious over the teachings in Kikuchi, the two chain-polymerization functional groups are $-\text{OCH}_2-\overset{\text{O}}{\text{CH}}-\text{CH}_2$ and $-\text{CH}_2-\text{O}-\text{CH}=\text{CH}_2$. Thus, said compounds comprise "only one functional group having a vinyl group" as recited in instant claim 23. Thus, for the reasons discussed in the rejections in paragraphs 6 and 7 above, the charge transport compound recited in instant claims 23-25 is prima facie obvious over the teachings in Kikuchi.

Art Unit: 1756

9. Claims 1-22 are allowable over the prior art of record.

Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not teach or suggest an organophotoreceptor comprising the charge transport material as recited in the instant claims 1-22 or the compounds recited in instant claim 26, for the reasons discussed in the office action mailed on Nov. 1, 2004, paragraph 16, which are incorporated herein by reference.

10. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1756

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The central fax phone number is (703) 872-9306.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Janis L. Dote
JANIS L. DOTE
PRIMARY EXAMINER
GROUP 1500
1700

JLD

Jan. 5, 2005